We claim:

1. A method for the mitigation of topological defects of an optical material, wherein said optical material comprises at least one layer of amorphous material, the method comprising planarizing with an ion beam only said at least one layer of amorphous material.

2. The method of claim 1, wherein said at least one layer of amorphous material comprises at least one layer of silicon.

3. The method of claim 1, wherein said at least one layer of amorphous material comprises a layer of silicon on a substrate.

4. The method of claim 1, further comprising depositing said at least one layer of amorphous material onto a substrate prior to the step of planarizing.

5. The method of claim 4, wherein said at least one layer of amorphous material comprises a plurality of layers of amorphous material, the method further comprising planarizing each layer of said plurality of layers of amorphous material.

6. The method of claim 4, wherein the step of depositing said at least one layer of amorphous material is carried out with a primary ion beam and wherein the step of planarizing is carried out with a secondary ion beam.

7. The method of claim 1, wherein said optical material comprises a bi-layer of optical material on a substrate, wherein said at least one layer of amorphous material forms one layer of said bi-layer and has an index of refraction that is less than a material that forms another layer of said bi-layer.

8. The method of claim 2, wherein said optical material comprises a bi-layer of optical material on a substrate, wherein said at least one layer of silicon forms one layer of said bi-layer and wherein molybdenum forms another layer of said bi-layer.

9. The method of claim 2, wherein said optical material comprises a bi-layer of optical material on a substrate, wherein said at least one layer of silicon forms one layer of said bi-layer and wherein beryllium forms another layer of said bi-layer.

10. The method of claim 2, wherein said at least one layer of silicon is an element of an EUV reticle.

11. The method of claim 1, wherein said at least one layer of amorphous material is deposited by ion beam sputtering at near-normal incidence and then subsequently etched by a secondary ion source at near-normal incidence.

12. The method of claim 2, wherein said at least one layer of silicon is deposited by ion beam sputtering with a primary ion beam at an energy within a range from about 400-2000 eV.

13. The method of claim 9, wherein the step of planarizing is carried out with an ion beam having an ion beam energy in the range from about 50–2000 eV.

14. The method of claim 6, wherein at least one of said primary ion beam and said secondary ion beam comprises a source gas selected from the group consisting of Argon, Krypton, Neon and Xenon.

15. The method of claim 1, wherein the step of planarizing includes directing an ion beam onto said at least one layer of amorphous material to remove a fraction of the layer between the values of 0.05 and 1.

16. An EUV reticle, comprising a bi-layer of optical material on a substrate, wherein said at least one layer of amorphous material forms one layer of said bi-layer and has an index of refraction that is less than a material that forms another layer of said bi-layer, wherein only said at least one layer of amorphous material has been planarized with an ion beam.

17. The apparatus of claim 16, wherein said at least one layer of amorphous material comprises at least one layer of silicon.

18. The apparatus of claim 16, wherein said at least one layer of amorphous material comprises a plurality of layers of amorphous material, wherein each layer of said plurality of layers of amorphous material has been planarized.

19. The apparatus of claim 16, wherein said at least one layer of silicon forms one layer of said bi-layer and wherein molybdenum forms another layer of said bi-layer.

20. The apparatus of claim 16, wherein said at least one layer of silicon forms one layer of said bi-layer and wherein beryllium forms another layer of said bi-layer.